

## REMARKS

The Examiner has objected to claims 16 and 17 for informalities. Claim 17 has been canceled. Claim 16 has been amended to remove the informalities. Accordingly, applicants respectfully request the Examiner to withdraw this objection.

In addition, the claim phrases “heat-resistant resin layer A” and “heat-resistant resin layer B” found in claims 9-14 have been respectively replaced with the phrases “heat-resistant resin sublayer A” and “heat-resistant resin sublayer B” to improve readability. The scope of these claims has not been altered by these amendments.

Claims 1-17 stand rejected under 35 USC 102(b) as being anticipated by Watanabe (US 4,937,133).

Applicants have amended claim 1 to recite a heat-resistant insulating film having “a coefficient of linear thermal expansion of 5 to 25 ppm/°C and a thickness of 5-75  $\mu\text{m}$ ” and heat-resistant resin sublayers A and B, the sublayer B being formed in contact with the metal layer and having a lower glass transition temperature than the sublayer A formed in contact with the heat-resistant insulating film. Support for this amendment can be found in canceled claim 8 and page 17, line 19, of this application.

Watanabe fails to disclose or suggest the claimed sublayers A and B, which are disposed between a metal layer and an insulating film with the claimed coefficient of linear thermal expansion and thickness, wherein the two sublayers have different glass transition temperatures as claimed. Working Examples 1-7 of Watanabe, for example, disclose a 35  $\mu\text{m}$  copper layer coated first with a 2  $\mu\text{m}$  thick high thermal expansion polyimide layer and then with a 23  $\mu\text{m}$  thick low thermal expansion polyimide layer (Watanabe, column 9, line 15-44, and Table 1). Thus, Examples 1-7 disclose forming only a single coating layer between the copper layer and the polyimide layer with the claimed thickness and thermal expansion coefficient, and the claimed sublayers A and B are not disclosed. Examples 8-21 likewise fail to disclose or suggest the claimed sublayers A and B disposed between a metal layer and an insulating film with the

claimed thickness and thermal expansion coefficient. Since claims 1, 3-6 and 9-15 depend from claim 1, this rejection should be withdrawn from these claims.

In addition, the claimed invention is directed to a laminate in which a self-supporting insulating film with a thickness of 5-75  $\mu\text{m}$  is laminated with a metal film through sublayers A and B. This laminate product is a completely different laminate product from the "bilayer cast product" disclosed in Watanabe (Specification, page 2, lines 26-27; page 3, lines 7-13; Watanabe, column 6, line 37-column 7, line 12). Watanabe's bilayer cast product is formed by coating and curing heat-resistant resin solution layers on a copper film, rather than laminating a self-supporting insulating film with a metal foil as claimed.

As explained on page 2, line 26-page 3, line 13, of this application, the copper foil of a bilayer cast product tends to shrink due to volume shrinkage and thermal contraction during the drying and curing. Especially, if the thickness of the copper foil is not more than 12  $\mu\text{m}$ , the operability further deteriorates. All examples of the copper foils used in Watanabe have a thickness of 35  $\mu\text{m}$ .

By matching the coefficient of linear expansion of sublayer A with that of the insulating film as claimed and by using a self-supporting insulating film with the claimed thickness, applicants have discovered that warping can be substantially reduced even when a very thin copper film is used (Specification, page 7, lines 23, to page 8, line 7; Examples and Comparative Examples). This effect is not disclosed or suggested in Watanabe.

Further, by laminating the claimed sublayer A in contact with the metal layer, applicants have obtained a laminate film having a metal layer free from warp even after etching the metal foil (Specification, page 23, lines 8-10; Examples and Comparative Examples). This is also not disclosed or suggested in Watanabe. Since Watanabe relates to a completely different type of laminate product and fails to disclose or suggest how to achieve the effects of the claimed invention, it would not have been obvious for a person of ordinary skill in the art to arrive at the claimed invention in view of Watanabe. Accordingly, this provides an additional reason for withdrawing the rejection of claims 1, 3-6 and 9-15. Similarly, claim 16 recites a process in

which a heat-resistant insulating film is laminated with a metal layer coated with a heat-resistant resin layer via heat press. Since Watanabe fails to disclose or suggest the same, this rejection should be withdrawn from all pending claims.

Claims 1-17 also stand rejected under 35 USC 102(b) as being anticipated by Takahashi.

Like Watanabe, Takahashi fails to disclose or suggest the sublayers A and B now claimed, which are disposed between a metal layer and an insulating film having the claimed coefficient of linear thermal expansion and thickness, wherein the sublayer B has a lower glass transition temperature than the sublayer A as claimed. Thus, this anticipation rejection should be withdrawn from claims 1, 3-6 and 9-15.

In addition, like Watanabe, Takahashi discloses a “bilayer cast product” formed by coating and curing heat-resistant resin varnish layers on a copper film—not a self-supporting insulating film that is laminated with a metal foil via resin layers like the claimed invention (Takahashi, column 1, lines 4-8). Thus, Takahashi relates to a completely different type of laminate product, and fails to disclose or suggest how to obtain the invention recited in the pending claims. Thus, this rejection should be withdrawn.

Finally, since neither Watanabe nor Takahashi discloses or suggests a laminate product obtained by laminating a self-supporting insulating film with a metal foil via the claimed resin sublayers as claimed, the claimed invention would not have been obvious in view of the cited references, either individually or combined together.

In view of the following, all pending claims in this application are in condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the above rejections and to pass this application to issue.

In the event that the transmittal letter is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing Docket No. **358682001300**.

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